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GASTRECTASIS.

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BY

L. WOLFF, M.D.,

PHILADELPHIA, PA.,

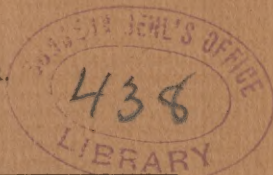
Physician to the German Hospital of Philadelphia; Demonstrator of
Chemistry, Jefferson Medical College, etc.

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GASTRECTASIS.

DILATATION of the stomach is known as that condition of the stomach when it is abnormally enlarged and its muscular fibres impaired to an extent that the gastric contents are only slowly or insufficiently propelled through the pyloric orifice. Not all large stomachs are dilated; in fact, there is quite a difference in the capacity of normal stomachs, so that, while some have been stated to have held only two hundred and fifty cubic centimetres, others are said even to hold as much as sixteen hundred cubic centimetres. One can really speak of an abnormally enlarged stomach only when it holds more than the latter amount. Even large and enlarged stomachs may not give rise to pathological digestion, but the dilated stomach, which may be an outcome of the former, always indicates a pathological structural change, and invariably gives rise to a disturbed peptic act.

There are two factors which may be considered as etiological of gastrectasis. Pyloric stenosis is one, and muscular atony of the stomach constitutes the other. In the former,



the condition of the obstructed pylorus may be compensated by a muscular development equivalent in propelling power to the obstruction, similar to the compensation in valvular obstructions of the heart. This natural tendency to equalization of impaired function can exist for a limited period only, and must soon give rise to muscular atrophy and genuine dilatation. The causes of stenosis of the pylorus are manifold, and may depend upon mechanical obstruction by external influence, as from floating kidney, pressure, and displacement of the duodenum; or it may result from pathological changes within the stomach, and its pyloric part in consequence of ulceration, inflammation, cicatrization, and neoplasm of either benign or malignant character. Thus polypi may be the cause, as well as an abnormal development of the mucous membrane of the pyloric part of the stomach, and catarrhal hypertrophy may result in the same condition. The dilated stomach may give rise to displacement itself, and with it a partially or totally obstructed duodenum, which cannot be overcome by the already impaired muscular force of the viscus. An increased and abnormal acidity of the gastric juice may besides these give rise to spastic contraction of the pylorus, and though this may not be permanent, it may be followed by true gastrectasis. In the same manner are ulcers, abscesses, and even foreign bodies capable of producing spastic constriction of the pylorus with consequent dilatation.

The gastric ectasis resulting from muscular atony of the stomach, the atonic dilatation of the stomach, may result by muscular exhaus-

tion from over-exertion, or the insufficient nourishment of the muscle consequent on anæmia, chlorosis, and nervous affections. Under this class may be also counted the chronic gastric catarrh and the loss of chemical digestive secretion which is known to form a stimulus for gastric peristalsis. The nervous elements contributing to muscular atony of the stomach are not sufficiently explained, though there seems no doubt a direct relation between a lack of intestinal peristalsis with gastric ectasis. As another cause of gastric dilatation may be mentioned the destruction of the muscular tissue of the stomach by ulcerative processes of some extent, though they may not themselves materially give rise to a loss of tissue, but rather cause cicatrization, with distention of other parts of the stomach.

The anatomical lesions of the muscular coat of the stomach in gastrectasis may present to microscopical inspection a hypertrophic appearance, according to location. Hypertrophy, or what might be called such, from the fact that the muscular tissue is infiltrated with inflammatory products, cancerous material, etc., may be readily defined with the microscope. The same may be said of cicatricial tissue, which may cause hypertrophy in the pyloric portion. Hypertrophy may and frequently does, in persons of advanced age, result in atrophy. Atrophy, however, is more usually found in the cardiac portion, and may be caused by colloid, but more frequently by fatty, degeneration, which increases, together with connective tissue, the interstices between the muscular

fibres. The appearance of the mucous coat presents a picture of inflammatory changes, and it may be smoothly disposed or at times even mammillated ; there is no marked change in some of the glandular ostia, though the volume of the tubes appear enlarged, and the ovoid cells may be seen in a condition of partial destruction and turbidity, while in some of them they appear to be partly or totally wanting.

Gastric dilatation is more apt to be met with in middle-aged people than in the young, though it has been reported in the young and even in children. The development of this condition is always more or less gradual, and on account of the prevailing symptoms it is in the beginning generally considered as simple dyspepsia, attributable to errors in diet or nervous causes. To the general symptoms of anorexia, epigastric pressure and fulness, abdominal distention, buccal fetor, supraorbital headaches, and irregularity of the bowels, there is to be added, as a characteristic feature of extreme dilatation, the vomiting, which occurs at intervals, when by super-added ingesta and the fermentative changes they are undergoing the distended stomach becomes irritated and reflex vomiting takes place. This may occur in periods of several days only, or may be even more protracted where total paralysis of muscular structure has ensued. There is one unmistakable feature of the vomiting of gastrectasis, and that is the enormous quantities which are ejected at one time, the comparative ease with which the emetic act takes place, and the character of the ejecta, which are com-

posed of the food particles of several of the meals previously ingested, together with the fermented appearance it presents and the gases arising therefrom on standing. The microscopic examination of the vomited matters reveals the presence of yeast fungi and other cocci and bacteria of decomposition, together with *sarcinæ ventriculi*, which at one time were considered so important, but have now no prognostic or diagnostic value.

The chemistry of the functional dilatation is, in cases where marked chronic catarrhal symptoms are absent, a normal one, or rather perhaps one of subacidity; in complete dilatation from pyloric stenosis, it is held by such eminent workers as Ewald and Riegel that in all cases non-cancerous they had found HCl, though in a diminished amount. I have not been able to confirm their statements, as in the case which I will present to you to-night the gastrectasis which resulted from complete pyloric stenosis was during the whole time of treatment accompanied with anacidity, and the patient, though apparently cured of his stenosis and improved in dilatation, presents yet the picture of total anacidity. The second case which I will present to you to-night of a functional dilatation, with chronic gastric catarrh, has shown from the beginning of treatment total anacidity, and acidity is returning gradually as result of treatment. The gastric distention in a dilated stomach is still further increased by the changes of decomposition, which give rise to gases of various kinds, such as CO_2 , H , CH_4 , H_2S , etc., which are only slowly regurgitated through the œsophagus; the patients,

besides, are troubled with pyrosis, from the presence of acetic, butyric, and lactic acids. This formation of organic acids and their by-products of gases are due to the lack of HCl in the dilated stomach. It is claimed that the irritant effects upon the gastric mucosa gives rise to another great symptom of gastrectasis, which is impaired absorption. The tests, hereinafter to be mentioned, with salol and KI, confirm this in an apparently clear manner, which, however, depends as much on a loss of muscular propulsion as on the chemical irritation. The patients suffering from high-graded dilatation soon manifest marked inanition, and while in such cases the vomiting becomes less frequent, the fetor of the eructations becomes more marked. The nearly lying viscera are displaced, fæcal discharges are more retarded, and dyspnœa and cardiac palpitation increase in a measure that the diaphragm is pressed upward by the distended stomach. Intestinal absorption is also diminished, causing dryness of skin and flabbiness of muscles, owing to the want of water of these organs. Nervous phenomena go hand-in-hand with this from the same cause, resulting often in coma, convulsion, and cardiac impairment. All these symptoms have been ascribed to the presence of ptomaines, poisonous gases, and by Litton to acetone ; but it is not apparent that, with a claimed lack of absorptive power, such auto-intoxication could be probable, and, in fact, Frederick Mueller has examined the contents of stomachs under such conditions for ptomaines without results.

The diagnosis of gastric dilatation is not always easily effected in its early stages ; the

ordinary symptoms of dyspepsia are more evident than the deeper-lying etiological factor. Before the characteristic vomiting takes place, medical examination will not always be directed to the employment of physical diagnostic measures. When this is done, inspection may lead, in the case of thin and pliable abdominal parietes, to reveal a protruding hemisphere, if the stomach is distended with gases or liquids, extending from beneath the ribs from the left to the right hypochondriac region ; its lower segment extends to the line of the umbilicus, or any portion below this towards the symphysis pubis. The curve may be altered in various ways, according to the position of the ingesta ; gastric peristalsis may become sometimes apparent under such conditions. The inspection may become facilitated by the employment of inflation of the stomach, which is best effected by an ordinary atomizer-bulb through a stomach-tube, more so than with the much-vaunted method of inflation by means of mixtures which generate CO_2 in the stomach. Further inspection in advanced gastrectasis reveals the abdominal parietes somewhat flabby and sunken over the empty viscus, the false ribs of the left side appear lifted up, and the skin is dry, pale, and of cachectic appearance.

Palpation of the epigastrium in the simple form of gastric dilatation will be of little aid in regard to the distended viscus, but may be said to be of the greatest value in the determination of the causes which lead to it. As I have already stated, complete gastrectasis is almost invariably, if not altogether, the consequence of pyloric disease and obstruc-

tion. This latter is capable of being discovered by palpation alone. Thus carcinomatous and other tumors can be detected on the right side of the epigastric region, and floating kidney, or even pyloric hypertrophy may so be ascertained.

The employment of percussion will be the first step to make the presence of dilatation more certain, if properly conducted ; thus the lower contour of the stomach may be with accuracy determined. If a stomach before inflation contains some fluid, or if the patient has been directed before inflating to take a glass of water, and he is thereupon examined in an erect position, the dulness of the water-line will be readily detected by percussion from above, while the lower segment of the fluid can be readily ascertained by the dulness which distinguishes it from the resonance of the colon from below. It may be necessary, however, for this latter purpose to inflate the colon, if it is not already tympanitic. Tumescence of the pyloric region may also be indicated by dulness of that part of the organ.

Auscultation may be used to advantage in gastrectasis, if combined with a tube and inflation in a stomach containing fluids. I have relied upon this method largely for determining the lower segment and extent of the distention. To this end I employ an ordinary small stomach-tube, having previously ascertained that the stomach was empty, or, if not so, having washed it out, I direct the patient to take a glass of water. If, now, the stomach is inflated while the ear is applied to the epigastrium, the point of greatest intensity of the bubbling sound of the air es-

caping through the small quantity of water contained in the stomach will accurately determine the lowest part of the stomach. In patients with thin abdominal parietes this will besides become readily apparent to palpation. The swallowing sounds, or "Schluck Geräusche," so important at times in the study of cardiac constriction, are of little, if any, importance in the study of gastric dilatation.

The chemical diagnosis of gastrectasis may be twofold,—first, as to the propulsive power of the stomach. As already stated, the power of the stomach to rid itself of its contents through the pylorus depends largely, besides the lumen of the latter, on the action of its muscular coat. With atony and paresis of the latter this is retarded, and in complete pyloric stenosis entirely abolished. This has been ascertained with great ingenuity by the administration of salol, which is a compound ether of phenyl and salicylic acid radical, and in the alkaline intestinal contents readily splits up into phenol and salicylic acid, the latter of which promptly appears in the urine as salicyluric acid, easily recognized therein on the addition of neutral ferric chloride, which turns it to a rosy-red color. Experiments have proven that salol is not directly absorbed by the stomach, and that its decomposition is probably brought about by the pancreatic secretion. Under normal conditions, the presence of salicyluric acid in the urine may be demonstrated within forty to seventy-five minutes after the ingestion of salol. Any period longer than that may be attributed to a paretic condition of the muscular coat of the stomach.

The chemical examination of the gastric secretion will indicate the pathological condition of the digestive function arising from dilatation, rather than give an idea of an existing ectasis. It must be said, however, that the determination of a faulty digestive secretion is, perhaps, the first step that leads us to suspect structural changes. I may say that, while I have examined numerous instances of gastrectasis in which I found HCl present, the quantity in each one of these was below normal, while in the older and graver cases I have never discovered any HCl. The pathological changes in the mucous coat, showing a partial and often total destruction of the ovoid cells within the ostia of the peptic glands, and our knowledge of the origin of this acid from these cells, would point to the impossibility of HCl secretion in old and extensive cases of dilated stomach, contrary to the opinions and writings of some who claim that such is and can be the case.

I have dwelt in several previous papers* on the subject regarding the technique of the chemical examination of the gastric secretion, and will, therefore, omit it here. I will state, however, that in numerous examinations of the secretion of dilated stomachs, in all stages, I have never failed to find the presence of pepsin, as shown by its digestive power on coagulated albumen when acidulated with HCl.

* "Recent Advances in the Diagnosis and Treatment of some Diseases of the Stomach," by L. Wolff, M.D. (*Medical News*, September 21, 1889); "Chemistry of Gastric Digestion," by L. Wolff, M.D. (*Transactions of the Philadelphia County Medical Society*, October 9, 1889).

As further physical means of determining the presence and extent of gastric dilatation, should be mentioned the complete filling of the stomach with water through a tube, and then siphoning out and measuring the water it contained. Any stomach found to hold more than two thousand cubic centimetres, or two litres, may be safely regarded, then, as dilated.

The prognosis of gastrectasis must vary with the causes of the dilatation; as a distended stomach itself is not a condition that would seriously impair health and life, the consequences rather than the structural change have to be taken into consideration. Dyspepsia and apepsia exercise, if not corrected, such pernicious influence on health that through malassimilation they may produce inanition, and thus prematurely end life. The degree of these is, however, conditioned by the structural changes that take place at the pyloric orifice. If these are malignant, the fatality of the disease is obvious, unless interfered with surgically. This is also the case with polypi of the pylorus and cicatricial stenosis; in this latter instance, however, the prognosis as to life is more favorable, not alone through the better results obtained with such cases by surgical procedure, but also by the removal of the hyperæmia, which may be obtained by relieving the gastric mucous membrane of the irritation by the pathological digestive act. Most favorable are the atonic cases of recent distention, owing to continued errors of diet and excessive eating and drinking. In these cases, which we may term for convenience paretic ectasis of the

stomach, good results will probably always follow proper treatment. As much cannot be said of cases where the distention is complete and the muscular fibres are in a state of paralysis. Under such circumstances, which are characterized by continued absence of HCl from the stomach, much can be done to relieve the distress consequent thereupon, together with the dyspeptic symptoms, and a lack of the proper elaboration of chymus in the intestines, and the malassimilation depending upon it. Little is to be hoped for reducing the viscus to its normal dimensions or establishing in such stomachs a proper chemical digestive act. Such patients, however, may be kept for years in a comfortable condition by observing a proper regimen or avoiding errors in diet. It is true that, sooner or later, the dilatation may give rise to conditions which are not easily overcome by palliative treatment, and for which, then, the surgeon's knife might hold out the only hopes for improvement. Since we know, however, that persons with gastric ectasis, and an absence of proper HCl secretion, may be able to live comfortably, and, under proper precautions, may certainly gain weight, such interference, when malignancy can possibly be excluded, should not expose patients to the risks of an operation until other measures have been exhausted.

The treatment should be directed, first of all, to relieve the symptoms of indigestion, the vomiting resulting therefrom, and the establishing of a proper peptic function. To this end it is obvious that emptying of the contents of the stomach, and the removal there-

from of the accumulated mucus, together with the causative elements of fermentation, are of prime importance. While emesis, so characteristic of this affection, will probably meet the first contingency, that of rendering the stomach aseptic can be accomplished only by lavage. To this end the stomach-tube should be employed daily, or even twice in that period ; the quantity of liquid to be employed depends on the condition supervening, but should not be suspended until the washings return perfectly clear. Where the catarrhal condition gives rise to the presence of viscid mucus, it is necessary to add to the water a drachm or two of sodium bicarbonate ; where the rank odor of butyric and acetic acids indicate the presence of organized ferments, additions of similar quantities of either sodium salicylate or sodium borate should be made. The time best suited for washing out the stomach is before the principal meal of the day, and may proceed this best by a half-hour. One of the most important features of the treatment next to this must always be the dietary regimen. Food substances which are slowly digested should be carefully avoided, as well as those which are prone to fermentation. It has been held that a dry diet should be the principal feature of such dietetic treatment, but I differ in this respect. *A priori*, it appears to meet the indications ; but when we consider that dry foods are not readily acted on by the peptic secretions, and that the stomach is certainly still capable of directly absorbing some liquids and liquid foods, the precaution appears superfluous, and it has proven of no advantage in

my experience. Milk diet, so freely and promiscuously ordered in all digestive troubles, is probably the most objectionable in this affection. Scraped meat on toast, white meats of fowl, stewed mutton, or boiled beef answer to excellent advantage when followed by 15 to 20 drops of HCl, diluted in a wineglass of water. Toast in limited quantities is more readily digested than ordinary bread, while succulent vegetables are permissible. One of the principal articles of diet is ordinary beef or mutton broth, to which, before being served, one or two raw eggs have been added and well beaten up. Of stimulants, nothing but dry white wines or clarets should be allowed at meals; pastry, puddings, and sweets must be, of course, studiously avoided. Such diet, however, may be suited for comparatively mild cases only. The graver cases, accompanied with almost complete aepsia, will be best maintained, per os, by the above-mentioned broths, with eggs, followed by HCl, while superadded to these must be rectal alimentation. As in such cases the bowels are always torpid, this measure is quite feasible, and may be continued for a considerable period. Nothing will so benefit such patients as nutritive enemata properly made and administered. It appears to me a mistake to exhibit as such any food in a soluble condition without being predigested. The lower bowel certainly secretes no digestive ferments to change food to an assimilable condition, whereas its absorptive power is well known. For this reason only such food should be exhibited per rectum that may be directly absorbed. I have been in the habit of using

from two to four ounces of pure glucose dissolved in starch mucilage, or even milk, as vehicle, three to four times daily, adding thereto one ounce of beef peptone, and stimulants if required. By such a course of rectal alimentation I have seen patients rapidly increase in weight and strength, and I have in my mind a case with complete pyloric stenosis who was carried to the hospital weighing eighty-nine pounds, and in three months thereafter left with a weight of one hundred and fifteen pounds, which subsequently increased to one hundred and forty-six pounds. I need scarcely mention that during rectal alimentation the bowels should be daily washed out with large enemata of lukewarm water.

I have already referred to the constipation supervening in such cases, and in order to obtain rapid absorption of food free alvine discharges must be procured. As we have to depend with such cases largely upon direct gastric absorption, the salines seem to be alone eligible for the purpose ; the Carlsbad salts or sulphate of sodium dissolved in hot water, taken directly after lavage, may be preferably employed to that end. Medication seems but little indicated. Besides the HCl given freely after the albuminous food to make up for the lack of acidity necessary to form peptones, and pepsin always being present, there is but one remedy upon which we can rely to produce contractility of the muscular fibres, and that is strychnine. Its tonic properties in such cases cannot be too highly praised, while of the other remedy recommended in such cases—the condu-

rango—I cannot say as much from my own experience.

As I have already stated, in the older and severer cases little is to be hoped from any means for establishing a smaller lumen of the viscus, or a return of the acid secretion of its glands ; this at times may certainly be accomplished by the treatment employed with that view. The two measures to be relied upon for that purpose are massage and the faradic current. While the former appeals to the fashion of the period, and no doubt promotes a healthy nutritive circulation, the internal faradization of the stomach is the most rational and serviceable of the two. External bipolar faradization, practised and extolled by some, will probably accomplish just as much or as little as massage. Why it should be employed when internal faradization is so easily and safely accomplished, and with such excellent results, is to be wondered at. The stomach electrode employed by me consists of a small nickel-plated brass olive screwed on to a flexible copper wire about one yard in length, and insulated by being covered with rubber ; it is easily introduced, either by the patient himself or the medical attendant. Before introducing the electrode, the patient should be directed to take one or two glasses of water. The current itself should be feeble at the beginning, and gradually increased until peristaltic movements are experienced by the patient, which may be even felt at times by the attendant through the external parietes.

As an illustration of what may be accom-

plished in cases of gastrectasis, I will now bring before you this patient :

R. M., aged 37, was born in Ireland, and is a stoker by occupation. He has been suffering from dyspepsia for about three years, for which he sought relief in various quarters. He came under my care about three months ago, complaining of epigastric fulness, anorexia, eructations, frontal headaches, furred tongue, buccal fetor, together with marked nervous symptoms, consisting of insomnia, melancholia, hallucinations of persecution, and has lost greatly in flesh.

Chemical examination of the gastric secretion revealed anacidity after trial meal, and on washing out the stomach large quantities of viscid mucus having an acrid odor were removed. Physical examination proved all organs, excepting stomach, to be normal. Inspection of stomach showed great distention, and auscultation of the inflated viscus revealed the lower segment about three inches below umbilicus. Siphoning out proved capacity of stomach about six litres. He states that during the time he is at work he drinks large quantities (gallons) of water. There was no tumescence or tenderness in pyloric region; no history of hæmatemesis and no cachexia. Diagnosis : atonic gastrectasis, with chronic gastric catarrh. Ordered suitable regimen, followed by HCl, also $\frac{1}{24}$ grain of strychnine t. d., daily lavage before principal meal, Carlsbad salt to be taken in morning while fasting, and internal gastric faradization, together with abstinence from excessive potations.

I will now extract some of the gastric se-

cretions, and you will see that they give a decided HCl reaction. On inflation you will find the lower segment of the stomach one inch above the umbilicus, and when I measure the contents of the full stomach, which I have siphoned out before you, I find it to be about three litres. You hear from the patient that his appetite is good, that he sleeps well, and, though still inclined to melancholia, he is so in a much less degree than formerly, also that he has gained in weight and strength.

